region of relatively soft metal has at least one annular groove in the neighborhood of the annular surface of the second annular region of relatively soft metal.

13. (Amended) The composite metal seal ring as claimed in claim 11, wherein the composite metal seal ring has a longitudinal axis, and the annular surface of the first annular region of relatively soft metal is tapered with respect to the longitudinal axis to have a varying radius that is smallest away from the second annular region of relatively soft metal and that is largest toward the second annular region of relatively soft metal, and the annular surface of the second annular region of relatively soft metal is tapered with respect to the longitudinal axis to have a varying radius that is smallest away from the first annular region of relatively soft metal and that is largest toward the first annular region of relatively soft metal.

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## REMARKS

In paragraph 2 on page 2 of the Official Action, claims 1-3 and 8-10 were rejected under 35 U.S.C. 102(b) as being anticipated by Hensley et al. (U.S. Patent 4,878,678). In response claims 1-2 and 8-9 have been cancelled. Claims 3 and 10 have not been cancelled because it is not seen where Hensley discloses that a core of relatively hard metal is inlaid with relatively soft metal of an annular region of relatively soft metal. Because claims 1 and 8 have been cancelled, claims 3, 5, and 6 have been amended to depend from claim 4, and claims 10, 12, and 13 have been amended to depend from claim 11.

In paragraph 4 on page 4 of the Official Action, claims 1, 3-4, 6, 8, 10-11, and 13 were rejected under 35 U.S.C. 103(a) as being unpatentable over Fyffe (U.S. 1,426,724) in view of Ogino et al. (U.S. 5,651,494). Claims 1 and 8 have been cancelled, claims 3 and 6 have been

amended to depend from claim 4, and claims 10 and 13 have been amended to depend on claim 11. Otherwise, applicant respectfully traverses this rejection, on the ground that it would not have been obvious to combine Fyffe with Ogino to arrive at the applicant's invention.

The Official Action, in paragraph 4, on page 5, recognizes that "Fyffe fails to disclose that the hard and soft metals are integrally bonded together." The Official Action, in paragraph 4 on page 5, says that "Ogino discloses integrally bonding of hard metal to soft metal by welding."

The Official Action, in paragraph 4, page 5, concludes: "It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the hard metal and soft metal of Fyffe to be welded as taught by Ogino to provide a bond between metals (col. 1, lines 41-43)." The applicant respectfully disagrees. A rejection under 35 U.S.C. 103 cannot be based on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale supporting the rejection. Common knowledge and common sense of a person of ordinary skill is insufficient. In re Lee, _____ F.3d ____, _____, 61 U.S.P.Q.2d 1430, 1435 (Fed. Cir. 2002). "[T]here must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the applicant." In re Dance, 160 F.3d 1339, 1343, 48 U.S.P.Q.2d 1635, 1637 (Fed. Cir. 1998). "[T]eachings of references can be combined only if there is some suggestion or incentive to do so." In re Fine, 837 F.2d 1071, 1075, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988) (Emphasis in original) (quoting ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984)). "[P]articular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed." In re Kotzab, 217 F.3d 1365, 1371, 55 U.S.P.Q.2d 1313,

1317 (Fed. Cir. 2000). See, for example, Fromson v. Advance Offset Plate, Inc., 755 F.2d 1549, 1556, 225 U.S.P.Q. 26, 31 (Fed. Cir. 1985) (nothing of record plainly indicated that it would have been obvious to combine previously separate lithography steps into one process); In re Gordon et al., 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984) (mere fact that prior art could be modified by turning apparatus upside down does not make modification obvious unless prior art suggests desirability of modification); Ex Parte Kaiser, 194 U.S.P.Q. 47, 48 (PTO Bd. of Appeals 1975) (Examiner's failure to indicate anywhere in the record his reason for finding alteration of reference to be obvious militates against rejection).

In the present application, there is nothing in the prior art of record to suggest the desirability of welding the soft metal to the hard metal in the seal of Fyffe. Fyffe appears to be entirely satisfactory for its intended purpose of making a metal-to-metal fluid pressure seal between two hubs. Fyffe and Ogino are in such diverse fields and deal with such diverse problems that one working in the pressure seal art would not be motivated to look to ultrasonic welding art. There is no basis for concluding that Ogino would have been considered by one skilled in the pipe seal art working on the particular problem with which the applicant's invention pertains. Moreover, there is nothing in Ogino suggesting that his ultrasonic welding should be used for fabricating a pressure seal. Furthermore, it appears that Ogino's apparatus of FIG. 2 would need to be modified somehow for welding of the hard and soft metal in the seal of Fyffe, due to the fact that Ogino's ultrasonic welding method drives the hard metal into the soft metal, as shown in FIG. 3A and described in column 2 line 66 to column 3 line 4.

In paragraph 6 on page 6 of the Official Action, claims 21 and 25 were rejected under 35 U.S.C. 103(a) as being unpatentable over Fyffe and Ogino. Applicant respectfully traverses.

The combination of Fyffe and Ogino has been distinguished above. In addition, the limitation of a thickness of 1/8 inch further distinguishes the combination of Fyffe with the other references showing thin films of soft or non-corrosive material, such as gold or silver plating, at a sealing interface. A thickness of 1/8 inch or more of relatively soft material functions in a substantially different way than a thin film, for example with respect to the stress relief and plastic flow described on page 15, line 15 to page 16, line 4 of applicant's specification. Claims 21 and 25 include additional limitations specifically directed to "effecting a resettable fluid pressure seal with respective annular surfaces of first and second hub members, ..." such as first and second annular regions of relatively soft metal, which are tapered in a particular way with respect to the longitudinal axis.

In paragraph 7 on page 6 of the Official Action, claims 5, 7, 12 and 14 were rejected under 35 U.S.C. 103(a) as being unpatetable over Fyffe and Ogino and further in view of Poe (U.S. Patent 4,563,025). Applicant respectfully traverses. The combination of Fyffe and Ogino has been distinguished above. There is nothing in Poe that makes up for the deficiency in Fyffe and Ogino, or would motivate one to modify Fyffe in view of Ogino. Moreover, each of the claims 5, 7, 12, and 14 define that an annular region of relatively soft metal has at least one annular groove in the neighborhood of the annular surface of the first annular region of relatively soft metal.

The Official Action (page 7, paragraph 7) says: "Poe disclose grooves on top of a deformable seal ring and the grooves are rectangular in cross-section and having walls that are perpendicular to tapered annular surfaces of the deformable seal ring (figure 5)." However, Poe says (Abstract): "The ring is designed so that the recesses separating the lands will essentially

maintain their integrity for all radial compressions to the ring which is intended for use solely within the elastic limit and below the yield point of the material of such ring." In other words, the sealing ring of Poe is directed to "the use of desirably hardened metal sealing rings made of stainless steel, for example, and cooperation with seats of softer metal or portions thereof might be deformed or scored." (Poe, col. 1, lines 36-39.) Therefore, Poe provides grooves in the sealing ring to provide multiple sealing lands, and "should a portion of the seat structure of the flange members become scored or damaged so as to prevent a complete sealing action to take effect as between such flange member and one of the sealing lands of the ring, the remaining lands will still be present to effect the sealing function. An equivalent advantage obtains where it is one of the lands that might have a marred surface; the remaining lands will effect the seal. The recesses between the sealing lands of the sealing ring are provided, additionally, in such sealing ring to distribute the stress pattern and also to enable the ring to remain within the elastic limit of the seal ring material." (Poe, Abstract.)

The Official Action (page 7, paragraph 7) concludes: "It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the first and second annular region of relatively soft metal to have grooves as taught by Poe, to maintain the integrity of all radial compression to the ring and also to enable the ring to remain within the elastic limit of the seal ring material (Abstract of Poe, lines 15-31)." However, Poe is placing grooves in relatively hard material of the seal in comparison to relatively soft material of the seat structure of the flange members. Therefore, the cited art does not provide proper motivation for putting grooves in the relatively soft metal regions of the applicant's seal. Placing grooves in the relatively soft regions of the applicant's seal would not tend to maintain the integrity of radial compression to the seal, since the grooves would tend to weaken the relatively soft regions of the

applicant's seal. The applicant, for example, puts grooves in the relatively soft material of the seal "in order to permit elastomeric O-rings to be used with the seal for sealing hub surfaces which have been slightly damaged; ..." (Applicant's specification, page 7, lines 5 to 8; page 16 line 9 to page 17 line 7.) In contrast, Poe is attempting to solve the sealing problem in a way different from the applicant's invention, by grooving relatively hard material of the seal instead of welding relatively soft material to relatively hard material of the seal.

In paragraph 8 on page 7 of the Official Action, claim 22 was rejected under 35 U.S.C. 103(a) as being unpatentable over Fyffe and Ogino and further in view of Poe. Applicant respectfully traverses. The combination of Fyffe, Ogino, and Poe has been distinguished above.

In paragraph 9 on page 8 of the Official Action, claims 23, 24 and 26 were rejected under 35 U.S.C. 103(a) as being unpatentable over Fyffe, Bloom, and Poe. Applicant respectfully traverses. The combination of Fyffe, Bloom, and Poe has been distinguished in applicant's Appeal Brief and in applicant's previous replies to Official Actions.

Claim 23 is dependent upon claim 21, and further defines that the composite metal seal ring is adapted for containing a pressure within the hubs of at least 10,000 psi. Claim 24 is also dependent on claim 21, and further defines that the composite metal seal ring has an internal diameter of at least 3 inches. Therefore, claims 23 and 24 distinguish Fyffe, Ogino, and Poe for the same reasons given above with respect to claim 21.

Claim 26 is an independent claim to a composite metal seal ring for effecting a "resettable" fluid pressure seal. Claim 26 includes limitations similar to claim 21 and therefore is distinguished from Fyffe, Ogino, and Poe for the same reasons given above with respect to claim 21. In addition, claim 26 further defines that the composite metal seal ring is adapted for containing a pressure within the hubs of at least 10,000 psi, the composite metal seal ring has an

internal diameter of at least 3 inches, and the composite metal seal ring is a hybrid of a pressure energized seal type AX and a compression seal type BX. In other words, the composite metal seal ring of claim 26 is especially adapted for solving the problem of making subsea pipe connections that can be set and reset a number of times during remote assembly and disassembly of high-pressure subsea pipelines. (Applicant's specification, page 2 lines 14-20; page 10 line 20 to page 11 line 1; abstract, lines 14 to 17.) It is not seen how any proper combination of Fyffe, Ogino, and Poe would solve this problem, and certainly not in the same fashion as called for by applicant's claim 26.

In view of the above, it is respectfully submitted that the application is in condition for allowance. Early allowance is earnestly solicited.

Respectfully submitted,

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**APPENDIX I. Version with Markings to Show Changes Made**

Claims 1 and 2 have been cancelled.

3. (Amended) The composite metal seal as claimed in claim [1] 4, wherein the core of relatively hard metal is inlaid and overlaid with the relatively soft metal of the annular region of relatively soft metal.

5. (Amended) The composite metal seal as claimed in claim [1] 4, wherein the annular region of relatively soft metal has at least one annular groove in the neighborhood of the annular surface of the annular region of relatively soft metal.

6. (Amended) The composite metal seal as claimed in claim [1] 4, wherein the composite metal seal has a longitudinal axis, and the sealing surface is tapered with respect to the longitudinal axis.

Claims 8 and 9 have been cancelled.

10. (Amended) The composite metal seal ring as claimed in claim [8] 11, wherein the annular core of relatively hard metal is inlaid and overlaid with the relatively soft metal of the first annular region of relatively soft metal, and the annular core of relatively hard metal is inlaid and overlaid with the relatively soft metal of the second annular region of relatively soft metal.

12. (Amended) The composite metal seal ring as claimed in claim [8] 11, wherein the first annular region of relatively soft metal has at least one annular groove in the neighborhood of the annular surface of the first annular region of relatively soft metal, and the second annular region of relatively soft metal has at least one annular groove in the neighborhood of the annular surface of the second annular region of relatively soft metal.

13. (Amended) The composite metal seal ring as claimed in claim [8] 11, wherein the composite metal seal ring has a longitudinal axis, and the annular surface of the first annular region of relatively soft metal is tapered with respect to the longitudinal axis to have a varying radius that is smallest away from the second annular region of relatively soft metal and that is largest toward the second annular region of relatively soft metal, and the annular surface of the second annular region of relatively soft metal is tapered with respect to the longitudinal axis to have a varying radius that is smallest away from the first annular region of relatively soft metal and that is largest toward the first annular region of relatively soft metal.